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10/089,925	08/09/2002	Tetsujiro Kondo	450101-03408	1206

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NEW YORK, NY 10151

EXAMINER

STORM, DONALD L

ART UNIT	PAPER NUMBER
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2626

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/089,925

Applicant(s)

KONDO ET AL.

Examiner

Donald L. Storm

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 and 39-45 is/are allowed.
- 6) ☒ Claim(s) 14-38 and 46-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Allowable Subject Matter

2. Claims 1-13 and 39-45 are allowed.

Drawings

3. The proposed substitute drawings (2 sheet(s), received July 13, 2006) are present and are now the Figs. 1 and 2 of record. These drawing sheets are substantively acceptable to the Examiner.

Claim Informalities

4. Claims 20 and 21 are objected to under 37 CFR 1.75(a) because the meaning of the phrase "said filter data of interest" (for example claim 20, line 4) needs clarification. Because filter data of interest was not previously recited, but decoded filter data was previously said, it may be unclear as to what element this phrase refers. To further timely prosecution and evaluate prior art, the Examiner has interpreted this phase as --filter data of interest--.
5. Claim 22 is objected to under 37 CFR 1.75(a) because the meaning of the phrase "said class taps extraction means" (line 2) needs clarification. Because no class taps extraction means was previously said, it may be unclear as to what element this phrase refers. To further timely prosecution and evaluate prior art, the Examiner has interpreted this phase as --said class tap extraction means--.

6. Claim 26 is objected to as failing to define the invention with the clarity required by 37 CFR 1.75(a). Because it is written in dependent form, claim 26 must be construed to incorporate by reference all the limitations of the claim to which it refers. Claim 16 includes a device comprising means; therefore, claim 26 includes that device. However, as written, claim 26 appears to be attempting to claim only some unspecified processing limitations of its parent claim. The Applicant should cancel the claim(s), or amend the claim(s) to further limit the parent claim with the clarity required by 37 CFR 1.75(a). To further timely prosecution and evaluate prior art, the Examiner has interpreted this phrase as --The data processing device--.

Claim Rejections - 35 USC § 102

Tsushima

7. Claims 14, 16-25, 27, 29-35, 37, 46, 48-50, and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsushima et al. [US Patent 5,978,759].

8. Regarding claim 14, Tsushima [at columns 3-4] describes an embodiment that learns tap coefficients in which a preset code is the basis for finding prediction values of filter data for LPC speech synthesis. Tsushima describes the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

a preset code [at column 4, lines 11-30, as created, codebook, spectral envelope codes];

tap extraction step for extracting taps from said code [at column 6, lines 38-42, as the comparator extracts the wideband spectral envelope code corresponding to the narrowband spectral envelope & at column 4, lines 11-30, as created, codebook, spectral envelope codes];

said taps being used for classifying target speech [at column 5, lines 20-29, as the mapping functions correspond to narrowband word speech mapped into the corresponding subspace by the mapping function];

the target speech is of high sound quality [at column 5, lines 30-40, as the expansion from narrowband minimizes distance between the original speech and synthesized speech];

prediction values of said target speech are to be found [at column 3, lines 47-column 4, line 15, as the spectral envelope converter converts spectral envelope parameters, using spectral envelope parameters of filter coefficients of a filter and the linear mapping function obtained from the spectral envelope codebook, into wider-bandwidth spectral envelope parameters];

classification step for finding a class of said target speech based on said taps [at column 5, lines 20-29, as the mapping functions correspond to narrowband word speech mapped into the corresponding subspace by the mapping function];

they are class taps [at column 5, lines 20-29, as each linear mapping function corresponds to a word mapped into the subspace division of M subspaces];

learning step for carrying out learning so that prediction errors of the prediction values of said speech of high sound quality obtained on carrying out predictive calculations using tap coefficients and the synthesized sound will be statistically minimum, from class to class [at column 4, line 61-column 5, line 32, as learning spectral envelope codes and corresponding linear mapping functions so that a distance between the linear predictive word speech analyzed to LPC parameters and a word speech mapped into the subspace of linear mapping functions can be minimized according to distances between the original speech and the synthesized speech for word speech mapped into the subspace division of M subspaces].

9. Regarding claim 16, Tsushima [at columns 3-4] describes an embodiment in which a preset code is the basis for generating filter data for LPC speech synthesis. Tsushima describes the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

a preset code [at column 4, lines 11-30, as created, codebook, spectral envelope codes];

code decoding means for decoding it to output decoded filter data [at column 4, lines 51-60, as linear mapping function calculator converts spectral envelope parameters correspondent to the linear spectral code and outputs them];

acquisition means for acquiring preset tap coefficients as found by carrying out learning [at column 4, lines 15-54, as selector selects spectral envelope codes corresponding to minimum distance to code in codebook created by assigning parameters to parameter subspaces];

means for carrying out preset calculations, using the tap coefficients and the decoded filter data, to find prediction values of the filter data [at column 3, lines 47-column 4, line 15, as the spectral envelope converter converts spectral envelope parameters, using spectral envelope parameters of filter coefficients of a filter and the linear mapping function obtained from the spectral envelope codebook, into wider-bandwidth spectral envelope parameters];

the calculations are predictive by a prediction means [at column 4, line 61-column 5, line 29, as spectral envelope codes and corresponding linear mapping functions were learned by linear predictive word speech analysis to LPC parameters and a word speech mapped into the subspace of linear mapping functions];

and send the found prediction values to a speech synthesis system [at column 3, lines 55-57, as the output of the spectral envelope converter used by an LPC synthesizer to synthesize a speech signal].

10. Claims 17-25 are rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

11. Claim 27 is rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

12. Claims 29-30 are rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

13. Regarding claim 31, Tsushima describes included claim elements as for claim 29, and Tsushima also describes:

predictive tap extraction means for extracting from said decoded filter data prediction taps used along with said tap coefficients for predicting said filter data as filter data of interest [at column 3, lines 47-52, as spectral envelope converter converts into spectral envelope parameters of a bandwidth, which is wider];

learning so that the prediction errors of the predicted values of said filter data obtained on carrying out predictive calculations employing said tap coefficients and prediction taps will be statistically smallest [at column 4, line 61-column 5, line 29, as learning spectral envelope codes and corresponding linear mapping functions so that a distance between the linear predictive word speech analyzed to LPC parameters and a word speech mapped into the subspace of linear mapping functions can be minimized].

14. Claims 32-35 are rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

15. Claim 37 is rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

16. Regarding claim 46, Tsushima [at columns 3-4] describes an embodiment in which a preset code is the basis for finding prediction values of filter data for LPC speech synthesis.

Tsushima describes the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

a preset code [at column 4, lines 11-30, as created, codebook, spectral envelope codes];

prediction tap extracting step for extracting prediction taps usable for predicting target speech, the prediction values of which are to be found [at column 3, lines 47-57, as spectral envelope converter converts into spectral envelope parameters of a bandwidth, which is wider, and synthesizes speech from the output];

the target speech is of high sound quality [at column 5, lines 30-40, as the expansion from narrowband minimizes distance between the original speech and synthesized speech];

the prediction values are found from said code (or other) [at column 6, lines 38-42, as the comparator extracts the wideband spectral envelope code corresponding to the narrowband spectral envelope & at column 4, lines 11-30, as created, codebook, spectral envelope codes];

tap extraction step for extracting taps from said code (or other) [at column 6, lines 38-42, as the comparator extracts the wideband spectral envelope code corresponding to the narrowband spectral envelope & at column 4, lines 11-30, as created, codebook, spectral envelope codes];

said taps usable for sorting the target speech to one of a plurality of classes, by way of classification, and acquisition step for acquiring tap coefficients associated with the class of said target speech from the tap coefficients [at column 5, lines 20-29, as the mapping functions correspond to narrowband word speech mapped into the corresponding subspace by the mapping function];

a classification step of finding the class of said target speech based on said tap [at column 5, lines 20-29, as the mapping functions correspond to narrowband word speech mapped into the corresponding subspace by the mapping function];

prediction step for finding the prediction values of said target speech using said tap coefficients and said prediction taps [at column 3, lines 47-column 4, line 15, as the spectral

envelope converter converts spectral envelope parameters, using spectral envelope parameters of filter coefficients of a filter and the linear mapping function obtained from the spectral envelope codebook, into wider-bandwidth spectral envelope parameters];

they are class taps associated with the class of said target speech as found by learning from one class to another [at column 5, lines 20-29, as each linear mapping function corresponds to a word mapped into the subspace division of M subspaces].

17. Claims 48-50 are rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

18. Claim 52 is rejected using the same rationale as in the prior Office action (mailed April 13, 2006).

Claim Rejections - 35 USC § 103

Tsushima and Omori

19. Claim 15, 26, 28, 36, 38, 47, 51, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. [US Patent 5,978,759] in view of Omori et al. [Japan Application Publication Number 2000-134162].

20. Claim 15 sets forth steps with limitations comprising the functionality associated with using the system recited in claim 14. Tsushima describes the similar limitations as indicated there; however, Tsushima does not explicitly describe a system embodiment having a recording medium with a program of the steps.

Like Tsushima, Omori [at Detailed Description 0028, Means 0021-0023] describes a speech bandwidth expanding receiver, and Omori describes:

a recording medium (of the steps) [at Detailed Description 0028, as the signal processing section of the equipment];

a program (of the steps) [at Detailed Description 0076, as software];

As indicated, Omori had described a recording medium having a program of steps for bandwidth expansion of speech at the time of invention. To the extent that a programmed processor is not necessarily in Tsushima's system, it would have been obvious to one of ordinary skill in the art of implementing functional descriptions of operations at the time of invention to include the concept of signal processor media used with program instructions to implement the processing functions of Tsushima because that would have provided the best implementation under particular circumstances identified and evaluated by a skilled artisan. For example, it is within the ordinary skill of an artisan to determine that software elements, such as Omori used, benefits changing processing functions or adding other processing functions because software elements are more easily modified than hardware elements.

21. Regarding claim 26, Tsushima describes the included claim elements by dependency as indicated elsewhere in this Office action. Tsushima [at column 3, lines 52-58] also describes the residual signal that is also input to the synthesizer to synthesize the speech signal. However, Tsushima does not describe a CELP-coding system, which should include coding for the residual, coefficients, and possibly other coded characteristics.

Like Tsushima, Omori [at Detailed Description 0028, Means 0021-0023] describes a speech bandwidth expanding receiver, and Omori describes:

encoding the speech in accordance with a CELP system [at Detailed Description 0019, as the coding approach in a voice coder is based on PSI-CELP].

As indicated, Omori had described encoding the speech in accordance with a CELP system that was known to artisans at the time of invention. Since Omori [at Means 0044] also points out

that encoding the speech in accordance with a CELP system has the advantage of a simple method of representing the speech, but providing a source of excitation of sufficient quality to preserve the harmonic structure and power of the original voice, it would have been obvious to one of ordinary skill in the art of speech codecs at the time of invention to include the known concepts, at least including CELP encoding of speech, as an encoding system suitable for Tsushima because it has the advantage of a simple method of representing the speech, but providing a source of excitation of sufficient quality to preserve the structure and power of the original speech.

22. Claim 28 sets forth limitations similar to limitations set forth in claim 27 and with additional limitations similar to the additional limitations of claim 15. Tsushima and Omori describe and make obvious the limitations as indicated there.

23. Claim 36 sets forth additional limitations similar to limitations set forth in claim 26. Tsushima and Omori describe and make obvious the additional limitations as indicated there.

24. Claim 38 sets forth limitations similar to limitations set forth in claim 37 and with additional limitations similar to the additional limitations of claim 15. Tsushima and Omori describe and make obvious the limitations as indicated there.

25. Regarding claim 47, Tsushima [at columns 3-4] describes an embodiment in which a preset code is the basis for finding prediction values of filter data for LPC speech synthesis. Tsushima describes the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

a preset code [at column 4, lines 11-30, as created, codebook, spectral envelope codes];

prediction tap extracting means for extracting prediction taps usable for predicting target speech, the prediction values of which are to be found [at column 3, lines 47-57, as spectral envelope converter converts into spectral envelope parameters of a bandwidth, which is wider, and synthesizes speech from the output];

the target speech is of high sound quality [at column 5, lines 30-40, as the expansion from narrowband minimizes distance between the original speech and synthesized speech];

tap extraction means for extracting taps from said code (or other) [at column 6, lines 38-42, as the comparator extracts the wideband spectral envelope code corresponding to the narrowband spectral envelope & at column 4, lines 11-30, as created, codebook, spectral envelope codes];

said taps being used for sorting the target speech to one of a plurality of classes, by way of classification, and acquisition means for acquiring tap coefficients associated with the class of said target speech from the tap coefficients [at column 5, lines 20-29, as the mapping functions correspond to narrowband word speech mapped into the corresponding subspace by the mapping function];

prediction means for finding the prediction values of said target speech using said tap coefficients and said prediction taps [at column 3, lines 47-column 4, line 15, as the spectral envelope converter converts spectral envelope parameters, using spectral envelope parameters of filter coefficients of a filter and the linear mapping function obtained from the spectral envelope codebook, into wider-bandwidth spectral envelope parameters];

they are class taps associated with the class of said target speech as found by learning from one class to another [at column 5, lines 20-29, as each linear mapping function corresponds to a word mapped into the subspace division of M subspaces].

However, Tsushima does not explicitly describe a system embodiment having a recording medium with a program of the steps.

Like Tsushima, Omori [at Detailed Description 0028, Means 0021-0023] describes a speech bandwidth expanding receiver, and Omori describes:

a recording medium (of the steps) [at Detailed Description 0028, as the signal processing section of the equipment];

a program (of the steps) [at Detailed Description 0076, as software];

As indicated, Omori had described a recording medium having a program of steps for bandwidth expansion of speech at the time of invention. To the extent that a programmed processor is not necessarily in Tsushima's system, it would have been obvious to one of ordinary skill in the art of implementing functional descriptions of operations at the time of invention to include the concept of signal processor media used with program instructions to implement the processing functions of Tsushima because that would have provided the best implementation under particular circumstances identified and evaluated by a skilled artisan. For example, it is within the ordinary skill of an artisan to determine that software elements, such as Omori used, benefits changing processing functions or adding other processing functions because software elements are more easily modified than hardware elements.

26. Claim 51 sets forth additional limitations similar to limitations set forth in claim 13.

Tsushima and Omori describe and make obvious the limitations as indicated there.

27. Claim 53 sets forth limitations similar to limitations set forth in claim 52 and with additional limitations similar to the additional limitations of claim 15. Tsushima and Omori describe and make obvious the limitations as indicated there.

Response to Arguments

28. The prior Office action, mailed April 13, 2006, requires corrected drawings, objects to the drawings, title, and claims, and rejects claims under 35 USC § 102 and § 103, citing Tsushima alone and with Omori. The Applicant's arguments and changes in RESPONSE UNDER 37 C.F.R. §1.121, filed July 13, 2006, have been fully considered with the following results.

29. With respect to objection to the drawings, the changes entered by amendment correct the drawing informalities. Accordingly, the objections are removed and the requirement for substitute drawings is withdrawn.

30. With respect to objection to the title, the changes entered by amendment are sufficiently descriptive. Accordingly, the objection is removed.

31. Amendment of the specification is acknowledged.

32. With respect to objection to those claims needing clarification, the changes entered by amendment provide clear descriptions of the claimed subject matter. Accordingly, the objections are removed. Please see new grounds of objection.

33. With respect to objection to the claim dependent upon a rejected base claim, the base claim has been allowed. Accordingly, the objection is removed.

34. With respect to rejection of claims 10-13 and 39-45 under 35 USC § 102 and § 103, citing Tsushima alone and in combination, the changes entered by amendment include prediction taps extracted from synthesized sound and used/usable for predicting speech.

The reference Tsushima does not explicitly describe that limitation and the current combination of Tsushima with other references does not make such a limitation obvious compared to the prior art of record for the whole structure and interaction expressed by the combination of all limitations. Accordingly, the rejections are removed. The Applicant's assertions with respect to Tsushima have been considered, but they are moot in view of the new claim element.

35. With respect to rejection of claims 14 and 15 under 35 USC § 102 and § 103, citing Tsushima, the Applicant's arguments appear to be as follows:

The Applicant's argument appears to be that Tsushima does not describe at least prediction taps extracted from synthesized sound and used for predicting speech of high sound quality, as target speech, the predictions values of which are to be found. This argument is not persuasive because the features upon which the Applicant's argument relies are not recited in the rejected claims.

The Applicant's arguments have been fully considered but they are not persuasive. Accordingly, the rejections are maintained.

36. With respect to rejection of claims 16-28, 29-36, citing Tsushima alone and in combination, the Applicant's arguments appear to be as follows:

a. The Applicant's argument appears to be that Tsushima's spectral conversion is not predictive to find prediction values of filter data to send to a speech synthesis filter. This argument is not persuasive because Tsushima [at column 4, line 61-column 5, line 29] describes that the spectral envelope codes and corresponding linear mapping functions predictive values are learned by linear predictive word speech analyzed to LPC parameters. The numbered section rejecting claim 16 has been revised and expanded in this Office action to point out the predictive calculations that lead to the spectral envelope codes and their mapping more clearly.

b. Note also that in claim 29, the features upon which the Applicant's argument relies are merely recited as an intended field of use in the preamble. Phraseology in the preamble does not limit the structure of the claimed device and is not essential to point out the invention defined by claim 29.

The Applicant's arguments have been fully considered but they are not persuasive. Accordingly, the rejections are maintained.

37. With respect to rejection of claims 46 and 48-51 citing Tsushima alone and in combination, the Applicant's arguments appear to be as follows:

The Applicant's argument appears to be that Tsushima does not describe at least prediction taps extracted from all three of synthesized sound, and a preset code, and information derived from that code, and the taps are used for predicting speech of high sound quality, as target speech, the predictions values of which are to be found. This argument is not persuasive because the features upon which the Applicant's argument relies are not recited in the rejected claims. The claimed subject matter is that the taps are derived from any one or more of synthesized sound, the preset code, or information derived from that code.

The Applicant's arguments have been fully considered but they are not persuasive. Accordingly, the rejections are maintained.

38. With respect to rejection of claims 47, citing Tsushima in combination, the Applicant's arguments appear to be as follows:

The Applicant's argument appears to be that Tsushima does not describe at least prediction taps extracted from synthesized sound, and from a preset code, and from information derived from that code, and the taps are used for predicting speech of high sound quality, as target speech, the

predictions values of which are to be found. This argument is not persuasive because the features upon which the Applicant's argument relies are not recited in the rejected claim.

The Applicant's arguments have been fully considered but they are not persuasive. Accordingly, the rejections are maintained.

39. With respect to rejection of claims under 35 USC § 103, citing Omor in combination with other references, the statement is sufficient to establish common ownership at the time the invention was made. Accordingly, the reference Omor is disqualified as prior art in rejections under 35 USC § 103 and the rejections are removed. Please see new grounds of rejection.

Conclusion

40. Any response to this action should be mailed to:

Mail Stop Amendment

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Alexandria, VA 22313-1450

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(571) 273-8300, (for both formal communications intended for entry and for informal or draft communications, but please label informal fax as "PROPOSED" or "DRAFT")

Patent Correspondence delivered by hand or delivery services, other than the USPS, should be addressed as follows and brought to U.S. Patent and Trademark Office, Customer Service Window, **Mail Stop Amendment**, Randolph Building, 401 Dulany Street, Alexandria, VA 22314

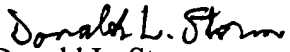
41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Division 2626, whose telephone number is

(571) 272-7614. The examiner can normally be reached on weekdays between 7:00 AM and 3:30

PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov. For general information about the PAIR system, see <http://pair-direct.uspto.gov>. If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

September 20, 2006


Donald L. Storm
Examiner, Division 2626